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Dental Fear, Anxiety, and Phobia – Behavioral Management and Implications for Dentists

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ABSTRACT



Clinical management of patients with dental fear, anxiety, and phobia could be a major challenge to daily practice of dental professionals. The aim of the current review was to expand the modern consideration with respect to these issues, and therefore to discuss basic approaches and psychological techniques for management of oral health behaviors that should be employed in dentistry. This paper presents detailed description of the characteristics of dentist-patient therapeutic relationship as well as the most used techniques to cope with dental fear, anxiety, and phobia - relaxation techniques, cognitive-behavioral therapy (CBT), hypnosis and melotherapy. We can still argue that knowledge from behavioral sciences, along with excellent communication skills, empathic attitude, and individual patient-centered approach remain the main armamentarium of the dentist to deal with “difficult” patients, experiencing fear, anxiety, or phobia during dental appointment.

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Introduction

Dental fear, anxiety, and phobia have significant implications for both patients and dental professionals [1]. Although there have been existing differences regarding the essence of fear, anxiety, and phobia [2-4], the latter used to result in delayed dental care or avoidant behavior [3-5]. This problem, therefore, could lead to deterioration of oral health status, socialization, and quality of life of the individual [4-6]. Additionally, clinical management of patients with dental phobia could be a major challenge to daily dental practice. Considering this group of patients as so called “difficult cases” [7], dental care providers need to acquire additional knowledge and skills beyond traditional medical and dental disciplines [8]. McGrath underlined in 2019 the importance of behavioral sciences in the promotion of oral health, specifically outlining behavioral therapies, such as cognitive behavioral therapy, for the management of dental anxiety, pain, and oral psychosomatic disorders [9].

Several authors have proposed distinct rules for dentist behavior to deal with the pain, anxiety, and stress of patients presenting for treatment [9,10].

- In-depth assessment of the patient's level of anxiety and stress through careful and accurate questioning. Uncontrolled anxiety and stress can lead to maladaptive, life-threatening situations, especially in medically compromised patients. The most important strategy is prevention.
- On the basis of all collected information, medical and personal, the adequate methods for pain and anxiety control are determined. It is essential to monitor the patient's response to selected behavioral methods.
- Pharmaceutical preparations are used as auxiliaries to enhance the positive effect, but not as a method of control. Medications suppress fear, but do not resolve conflicts. The emphasis should be on good rapport and communication with the patient.
- Control techniques should be applied to the patient's needs. Applying only one method to all patients can lead to failure (e.g., nitric oxide sedation in moderately severe emotional problems).

Given this general framework regarding behavioral management of dental patients experiencing stress, fear, anxiety, or phobia, the aim of the current review was to expand the modern consideration with respect to these

issues, and therefore to discuss basic approaches and psychological techniques for management of oral health behaviors that should be employed in dental practice.

Discussions

Approaches to the management of problem behavior in patients with dental fear, anxiety and phobia

Cooperation between the dentist and the patient is needed to reduce the intensity of fear and panic attacks in dental phobia. It is important that the dentist should be not only a good specialist, but also an excellent psychologist. Important points in solving the problem are:

1. Information and preparation

In 1967, Nathan Friedman described a method called "iatrosedation" consisting of two components, an interview and a clinical encounter. His method is based on the practitioner's communication skills and behavior, aims to identify the causes of anxiety or fear, and then, by applying an individual approach, helps to overcome them. The result is not only that the patient receives successful treatment, but also, he learns and gains confidence from his experience, as well as greater trust in his doctor [11-13].

The term "iatrosedation" is formulated by combining the prefix "iatros" (healer) with sedation (calming) or literally it means calming through the doctor's behavior. The general term for psychological sedation (psychosedation) includes iatrosedation and pharmacosedation (sedation by medication). In the treatment of a patient with dental anxiety, iatrosedation is considered to be the primary technique and pharmacosedation is secondary. While sedation with medication only temporarily reduces the patient's anxiety, with the help of iatrosedation the patient's fear can be reduced to a functional level, which will allow him to cope autonomously in future situations [12,13].

Formation of dental fear usually begins with the first contact with the specialist. In many cases this contact is still during the childhood. As a result, the first meeting with the dentist could be traumatic. Therefore, if the patient is a child, it is very important to prepare the child for the appointment a few days, even a week or a month in advance. A key point is the game (game of "dentists"). First is the explanation of what this person is doing, then – the demonstration. Some photos or a suitable video can be used as well. The combination of two techniques (TSD - "tell, show, do" and AVD - audio-visual distraction) is considered to have an additive effect in reducing anxiety levels and is more beneficial [14]. After the preparation, the game is started, in which the roles are exchanged - the child is the "specialist", and the "patient" is the adult (parent or dentist). The child is provided with a basic set of accessories to make the game more fun: white apron, chair, toothpaste, mirror, flashlight, etc. In general, cognitive behavioral play therapy is more effective in reducing

preoperative anxiety in children than audiovisual distraction and tell-show-do techniques. Focusing on this first preparation is extremely important, as it largely determines the attitude of the child towards going to the dentist [15].

If the patient with a phobia is an adult, gathering information about his fears and providing information about the nature of the procedures, are also the first steps towards overcoming the problem [13]. In this aspect, clarifying the possible causes of his fears is key to overcoming the patient's defenses and his "successful accession" to the therapeutic process. Most often, these defences are related to lack of knowledge, prejudices, or the impact of negative experiences from the past. Preparing the patient for the subsequent treatment means creating a therapeutic relationship that implies sincerity, information, trust, and mutual responsibility [16]. Success of the treatment depends on the dentist's ability to actively involve the patient in the treatment process.

In this regard, greetings, addresses, creation of an appropriate atmosphere and even the way of dressing are of special importance. The indisputable role of non-verbal signs such as smiles, gestures and positions has been proven. The use of paralinguistic signs is important - intonations, rhythm of speech, laughter. They are not only a channel of empathy, but also a means of mental intimacy [13,16]. The main characteristic of dentist's behavior should be naturalness. Friendliness and its physical expression should not be overplayed, as they can arouse suspicion and mistrust [16].

It is important to show realistic optimism while avoiding engaging in accurate answers. If the patient has poor dental health and poor oral hygiene and is fully aware of his status and the reasons for this, additional suggestions with negative statements by the dentist do not help the situation. In this case, more appropriate remarks would be: "Yes, you have a lot of problems, but I do not see anything serious or irremediable". Arousing interest in yourself and your work is an important prerequisite for the therapeutic relationship. No effort should be made to seduce the patient, especially by blaming relatives or expressing negative opinions about other professionals [16].

Practice has shown that patients with dental phobia are classified in the group of so-called "difficult patients". Almost 80% of dentists report that they themselves are anxious when treating such patients [10]. In that sense, the quality of the therapeutic relationship acquires special significance. However, this relationship is not a sustainable fact. Vasilev postulated in 2021 that the emerging doctor-patient relationship is a key factor in the treatment-diagnostic process [17]. Important for this relationship are lasting psychological constructs as well as mental states - dental anxiety in patients and empathy in the professionals treating them. According to the author, individual and

personal characteristics of the patients determine the level of their dental anxiety, which in turn determines patients' criteria for the work of the doctor and the quality of the therapeutic relationship. Patients with higher levels of neuroticism, melancholic temperament, as well as oral, masochistic, and rigid types of character, are more likely to experience increased dental anxiety. On the other hand, dentists with higher levels of extraversion, emotional stability, benevolence, and conscientiousness, as well as psychopathic and rigid character types, tend to apply positive and constructive interpersonal strategies in their work with "difficult patients". More empathetic dentists are significantly less likely to avoid such patients [17].

According to Carlozzi (2002) some mistakes that hinder therapeutic relationship are [16]:

- The professional manner of communication, related to clear role and status distinctions; exaggeration with medical terminology, and vice versa - reduction of communication to an informal everyday level and loss of role identity.
- Evaluation, moralizing, teaching, and counseling.
- Reporting diagnoses and firm opinions about the success or failure of the treatment.
- Excessive praise and encouragement.
- Taking full responsibility for the process and offering ready-made solutions.

2. Coping with unpleasant experiences in the past

Once occurred, dental phobia is difficult to be controlled. However, this is not impossible. Talking to the patient is necessary. He needs to share exactly what he is afraid of. If this is the sound of the instruments, he may be offered to listen to music with headphones or appropriate sound in the office. There are TVs in some dental offices that can be used for distraction during the treatment procedure. If the fear is caused by the dentist himself, the procedure should be preceded by a conversation in which the doctor should explain to the patient what lies ahead. If the patient is a child, the presence of the parent in the dental office would also have a calming effect. Therefore, when fear has already arisen, key factors are communication and prior explanation of what lies ahead. Distracting elements are also important, as they aim to predispose and calm the patient down [18,19].

3. Sense of control

The patient has the right to be aware of all procedures that lie ahead. By learning more, one reduces his fear of the unknown. The patient also has the right to decide on the method of treatment. He should be honest with the dentist - how much work he can handle in the beginning. Gaining self-confidence and trust in the team, the amount of work he will endure will gradually increase. A specific signaling system needs to be established so that treatment can be stopped at any time when the patient needs more

anesthesia, wants to rinse, or just wants some rest. The most common signal is a show of hands [10,20].

4. Feeling uncomfortable

Patients with dental phobia have often ridiculed their dental treatment or feel uncomfortable with their current condition and carelessness. The role of the dentist is to explain to the patients not to bother to talk openly about their problems. He must understand the patient's concerns and show his empathic attitude towards the problem [13].

5. Relaxing technique

If the patient feels tension while in the dental chair, the easiest way is physical relaxation - a relaxed body helps to relax mentally. The human body cannot be physically calm and tense at the same time. The easiest techniques are deep breathing, muscle relaxation [3]. If the patient manages to relax in the presence of a stimulus that causes fear in him, this fear will be significantly reduced.

6. Distraction and redirection

Once the patient feels more relaxed during his visits, various ways can be used to distract him from the direct work in the mouth - listening to music he likes, watching TV and more. The technique aims to focus on another stimulus. Appropriate music has been shown to affect brain waves, leading to deep relaxation and relieving pain and anxiety. Music distraction is a non-invasive technique in which the patient listens to pleasant music during a stressful procedure. The effect is believed to be a combination of relaxation and distraction, which in turn reduces the activity of the endocrine and sympathetic nervous systems. It has been used successfully in both children and adult dental patients [21,22].

7. Pain control

Modern dentistry has methods of local anesthesia which block the sensation of pain. The dentist should explain to the patient that he should not be afraid of the injection. All anesthetics are applied slowly. The needle itself does not cause pain - it is very thin, and the feeling of discomfort is a result of the pressure and volume of the fluid being injected. Detailed explanations, with linguistic means that the patient would understand, will greatly contribute to reducing his fear. If the iatrosedative technique is not enough, modern science provides new technologies in the application of local anesthesia that help relieve anxiety. Some examples in this regard are computer-controlled local anesthesia [23,24], electronic dental analgesia [25,26], computer-assisted relaxation training to reduce fear of dental injections [23], intraligamentary anesthesia and vibrotactile devices [3].

Coping with dental anxiety and phobia - psychological techniques

Psychological techniques and strategies for dealing with the problem are different. The individual approach of the specialist regarding their selection would greatly

facilitate the management of each specific situation. The most commonly used techniques are the following:

1. Relaxation techniques

Deep breathing and muscle relaxation are regularly practiced to relieve the symptoms of anxiety, as well as exercise programs.

- Deep (diaphragmatic) breathing

The most important and basic way in which patients can relax physically is the application of proper breathing techniques. Using the diaphragm for breathing reduces tension in the chest and provides more oxygen to the body with each inhalation. The technique is performed as follows: the patient's body and head are straight, without leaning forward or backward; one hand is placed on his chest and the other on his abdomen; after exhalation, the patient begins to inhale slowly and evenly, followed by a new slow and steady exhalation; exhalation should last longer than inhalation [3,27]. Described technique can also be applied in highly anxious patients with a pronounced pharyngeal reflex [28].

- Progressive muscle relaxation

The most common technique that is recommended for anxious patients is Conrad's progressive muscle relaxation. It involves contracting certain muscle groups for 5-7 seconds, followed by 20 seconds of relaxation. The method can be demonstrated on the dental chair and should be practiced and rehearsed by the patient at home. Usually, four basic muscle groups are trained. These are: 1) legs, calves, hips, and buttocks; 2) hands, forearms, and biceps; 3) chest, stomach, and waist; and 4) head, face, throat, and shoulders. Described relaxation technique is exercised for about 15-20 minutes [29]. It relaxes the whole body and reduces tension. At the discretion of the doctor, the technique can also be directed to a particular muscle group.

It is recommended to use relaxing breathing and muscle relaxation at the same time. The patient should strain a certain group of muscles during inhalation and then relax them during exhalation. Relaxing techniques can also be combined with visualization techniques or guided mental imagery and biofeedback [3].

2. Cognitive-behavioral therapy (CBT)

Behavioral and cognitive techniques for reducing patient's anxiety during dental treatment have proven positive influence and effectiveness in both children and adults [30-32].

Theoretical basis of cognitive-behavioral psychotherapy is in behaviorism [33]:

- Ideas of classical conditioning – I.P. Pavlov (1849-1936) - organisms learn to detect causal links between environmental stimuli (Stimulus → Reaction).

Heightened fear of the dentist and dental treatment in some cases can be considered as a conditional answer similar to the answer in the classical conditioning described

by Pavlov. A brief overview of this paradigm is the following: Pavlov gives food (an unconditional stimulus) to dogs, and this leads to salivation (unconditional response). He then gives food to the same dog, while at the same time pairing this stimulus with a bell (conditional stimulus). After a certain number of pairs, only the sound of the bell becomes a sufficient incentive for salivation (conditional response). A similar example of an experience in the dental office, which can be likened to classical conditioning, is this: when a child is taken to a dentist, an unpleasant stimulus (pain) causes a reaction of intense fear. The pain can be caused by the drill or the needle, but the dentist is connected to the instrument that causes this pain. He may then be likened to a conditional stimulus, and the fear associated with his presence or only the thought of him may be likened to a conditional answer. Such a traumatic event can lead to a life-long conditioned response associated with high anxiety, unless relearning or counterconditioning is carried out [11-13].

Conditioning can also lead to generalization - the effect of initial traumatic situations that have similar elements, such as medical experiences (injections for immunization, for the administration of antibiotics or topical anesthetics, dressing traumatic wounds, tonsillectomies, etc.) is generalized to dental situations if they have similar characteristics [10,13].

- Theory of operant conditioning - B.F. Skinner (1904-1990) - conditioning is a process by which behavior is acquired, maintained, or decreased depending on its subsequent events (reward - positive reinforcement or punishment - negative reinforcement) [33].

Positive reinforcement is an effective technique for rewarding the desired behavior and thus enhances the repetition of these behaviors. Commonly used means for this purpose are the positive modulation of the voice, the expression of the face, the verbal praise, or the appropriate physical demonstrations of attachment by all members of the dental team. They must be individualized, often provided, and varying over time. Positive reinforcement is one of the most widely used technique for behavior management in pediatric dentistry [3,34].

- Theory of social learning - Albert Bandura (1925-2021) - he underlines the importance of imitation (modeling) in learning - it is not only a product of personal experience, but often under the influence of significant figures for the child and this leads to the formation of different behavioral patterns [33].

Modeling is an indirect or vicarious learning experience. Fears often arise in children because of their observations of traumatic experiences of parents, siblings, or friends, or hearing stories of these experiences. This type of learning can also be the result of seeing traumatic dental scenes portrayed in television skits, motion pictures, or cartoons [13,35].

Aaron Beck (1921-2021) and Albert Ellis (1913-2007) turned behaviorism into cognitive-behavioral therapy. In 1953 the term behavioral therapy appeared. During the 60s of the 20th century Aaron Beck introduced into practice Cognitive therapy, and at the same time A. Ellis- Rational emotive behavior therapy (REBT) [33].

Aaron Beck introduced a description of how each individual regulated his behavior. According to the cognitive model there are 3 cognitive levels (Figure 1) [33].

a) First level - core beliefs (basic, generalized views about oneself, the world, and the future – the cognitive triad) - they are formed in early childhood under the influence of parental figures; in most cases they are negative and irregular. Beck believed disorders were maintained by negative attitudes and distorted thinking.

b) Second level - assumptions and rules - they regulate human daily behavior.

c) Third level - automatic thoughts (surface-level cognitions) - they arise suddenly, involuntarily and are the concretization of assumptions and rules in a particular situation.

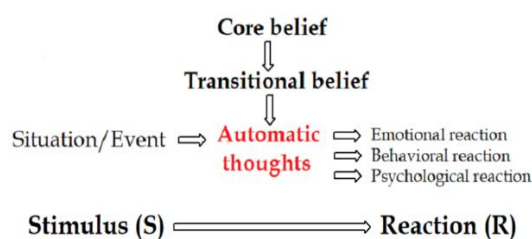


Figure 1. Cognitive model [33]

When does a problem occur?

When automatic thoughts are incorrect (dysfunctional) - so is the behavior - cognitive distortions occur. The aim of therapy is to process automatic thoughts in order to change core beliefs. The goal of cognitive therapy is that the patient, together with the therapist, creates new experiences that allow him to weaken those he has had since childhood, and which are negative for his way of feeling and acting. For example, a person who has a misconception and has developed a phobia of going to the dentist because he thinks that if he does, he will collapse or panic, can be argued and convinced that dental treatment could be painless and would not provoke such emotional, behavioral, and physiological reactions.

Albert Ellis postulated that behavior and emotions were determined by the interpretation of cognitions. Rational emotive behavior therapy (REBT) is based on ABC theory (Figure 2).

- activating event
- belief to which it leads (incl. values, philosophy of life, thoughts, etc.)
- consequences - emotional, behavioral, or cognitive type of reaction

- disputations - discussion and contestation of beliefs between client and therapist
- effective new beliefs - the result of properly conducted therapy and confrontation with wrong thoughts.

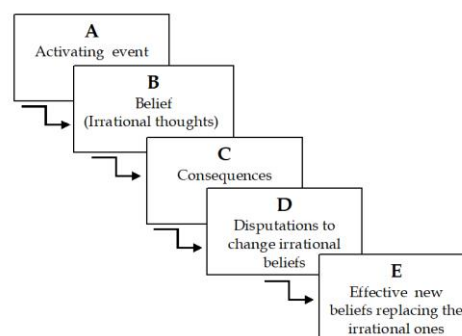


Figure 2. ABC - model

The main steps in Cognitive behavioral psychotherapy are:

- Explaining the theoretical model - this is explained to the patient (builds trust).
- Identification of automatic thoughts.
- Connecting them with the relevant behavioral pattern of the patient.
- Belief that they need to be changed by using certain techniques.

The *cognitive restructuring technique* can be used to change the patient's negative thinking and misconceptions (fearful thoughts that reinforce the phobia). The aim is to change the way of perceiving the situations that are threatening for the patient through arguments for and against, where the irrational beliefs are refuted and replaced with new ones. The patient begins to see the illogicality in his thinking and overcomes the reasons for maintaining his unrealistic fears [36,37].

The *technique of systematic desensitization* has also been proven to be effective. This is a type of behavioral therapy based on the principle of classical conditioning. It was developed by Joseph Wolpe (1915-1997) in the 1950s. This therapy aims to eliminate the fear of phobia response and replace it with a relaxing response to a conditioned stimulus, gradually using counterconditioning [38]. The procedure takes place in several sessions. The patient compiles a hierarchical scale according to the strength of his fears. He must then be trained in some of the relaxation techniques (most often deep breathing and muscle relaxation). He has to imagine the first situation on the scale (the weakest) and through the relaxation techniques to deal purely emotionally with it to the point of desensitization. Then he should move on to the next situation, which causes anxiety and fear, to overcome it in the same way and to continue to the end of the scale (imaginary desensitization - facing the phobic situation is gradual and is only in the imagination, through a series of small steps). The time and number of sessions are different for each patient [38,39].

If the phobia has symptoms of panic disorder, the following techniques may also be used [40]:

Panic control therapy - identifying and eliminating catastrophic thoughts (such as "I'm going crazy!" or "I'm going to have a heart attack!") that usually cause panic attacks.

Interoceptive desensitization - practicing voluntary adaptation to the body's symptoms of panic such as rapid heartbeat, sweating of the palms, shortness of breath or dizziness. These symptoms are caused intentionally, usually in the therapist's office. For example, dizziness can be caused by turning in a chair, and the accelerated pulse - by running up and down the stairs. Repeated contact with unpleasant bodily symptoms causes desensitization, which means gradually getting used to them until they stop scaring.

Medication - SSRI antidepressants such as Paxil, Zoloft, Lexapro or Celexa or benzodiazepines such as Xanax, Ativan or Klonopin can be used to reduce the severity of panic symptoms.

Lifestyle and personality changes - stress management, regular exercise, elimination of stimulants and sugar from the diet, slowing down the pace of life, providing rest and change in attitudes such as perfectionism, excessive desire to be liked by others and excessive need for control.

3. Hypnosis and melotherapy

Beginning of hypnosis was associated with the name of Franz Anton Mesmer (1734-1815) as one of its purposes was to relieve pain [41]. The first tooth extraction under hypnosis was done by Jean-Victor Oudet in 1829. [42]. In the 19th and 20th centuries, interest in the use of hypnosis in dentistry increased. In 1955 The British Society of Dental Hypnosis was founded. In Bulgaria, the beginning of the application of hypnosis in dental practice was set by P. Petrov in 1978. He defended his dissertation on "Dental psychotherapy - opportunities for application in the district health service" [43].

According to Moss (1951) the field of application of clinical hypnosis in dentistry is in two directions [44]:

- Therapeutic hypnosis, which is used to relax the patient; to remove the internal tension, anxiety, fear of pain and discomfort; to remove the resistance against an orthodontic appliance or prosthetic construction; for maintaining positive comfort in the patient during treatment; to help the patient get used to orthodontic appliances and prostheses; for elimination of some bad habits; for solving problems when working with children; in bruxism and bruxomania.
- Surgical hypnosis, which is used for: avoidance of drug anesthesia; amnesia of unpleasant sensations; premedication alone or in combination with general anesthesia; removal of increased pharyngeal reflex; control of increased salivation; prevention of bleeding; postoperative anesthesia; prevention of postoperative complications.

Hypnosis can be performed according to the rules adopted in the respective country, with patient's or his guardians' consent and in the presence of a witness (assistant) [43].

In 1983 Spasimir Gazdov introduced the term "melotherapy". According to him most people (regardless of age) react negatively, with fear and anxiety, to dentistry. He believed that music was a universal tool for maximum positive impact on the psycho-emotional background during dental treatment. Gazdov studied the influence of a certain musical background on the pain syndrome during dental procedures on the hard tooth tissues. He called this type of phonoanalgesia melotherapy [45,46].

It has been proven that when listening to music, many more processes take place in the human body than simply stimulating the auditory analyzer. According to a recent study by Salimpoor et al. (2013), music triggers the activity of nucleus accumbens, part of the brain's mesolimbic system, which releases dopamine, which is involved in shaping expectations. At the same time, the auditory cortex, the amygdala involved in emotion processing, and the ventromedial prefrontal areas of the cerebral cortex involved in decision-making, perceptual analysis, and evaluation, are activated [47].

Another study by Chanda & Levitin found that listening to music led to less anxiety and lower cortisol levels among patients about to undergo surgery than taking anti-anxiety drugs [48].

According to Fábíán & Fábíán, the photo-acoustic stimulation leads to powerful stimulation of the central nervous system while relaxing the body. It is thought to eliminate anxiety and reduce salivation in the oral cavity [49]. It has been found that the combination of photoacoustic stimulation and hypnotic techniques is an excellent method for the treatment of orofacial psychogenic symptoms and intolerance to dental prostheses. However, in the case of patients with dental phobia, the combined method has been found to be less effective than the use of hypnotic techniques alone [50].

Conclusions

Despite the variety of therapeutic, pharmacological, and psychological approaches and techniques to address the fear, anxiety and phobia associated with dental treatment, the latter still remain a significant challenge in the daily work of the dental professionals. The multifaceted constructs of dental anxiety, fear, and phobia (personal characteristics of the patient, attitudes and expectations of treatment, previous experience, etc.) imply the presence of in-depth knowledge to overcome them. In this aspect, the dentist's behavior acquires particular significance, aimed at identifying the causes of anxiety or fear and subsequently, helping to cope with them. Along with excellent communication skills, it is important to

remember that having an empathic attitude and an individual patient-centered approach remains the main technique in the fight against fear, anxiety, and phobias. The therapeutic relationship dentist-patient should be characterized by resilience, naturalness, and a sufficient dose of situational flexibility. Results will be demonstrated not only in the successful treatment that the patient receives, but also in the acquisition of confidence, experience, and greater trust in his doctor. The patient's autonomy is challenged in the direction of the right choices related to his treatment and health.

Highlights

- ✓ Basic approaches to problem behavior management of patients with dental fear, anxiety, and phobia are discussed.
- ✓ Psychological techniques for coping with dental anxiety and phobia are presented in the following sequence:
 - Relaxation techniques - deep (diaphragmatic) breathing and progressive muscle relaxation.
 - Cognitive-behavioral therapy (CBT) and Rational emotive behavior therapy (REBT)
 - Hypnosis and melotherapy

Conflict of interest disclosure

There are no known conflicts of interest in the publication of this article. The manuscript was read and approved by all authors.

Compliance with ethical standards

Any aspect of the work covered in this manuscript has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript.

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